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Applicant: Griffin
Serial No.: 10/802,347
Filed: 03/17/2004
Title: COMPACT FOLDABLE RAMP
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a hinge with a hinge bar connecting each pair of adjacent ramp sections ~~end~~
~~to end longitudinally, and~~
end members transverse on adjacent ramp section longitudinal first and
~~second ends~~ each end member with an abutting surface facing outward
from its respective section end with its normal longitudinal with the ramp
adapted with opposing said abutting surfaces of said end members of
adjacent sections directly abutting together longitudinally when the ramp
is unfolded, rotating on said hinges into and out of abutment such that
load forces are conveyed through abutted sections to ramp ends, said
hinge spaced apart from said end members so as not to interfere with
said end member abutment,

wherein said hinges respectively connecting the abutting section ends are
disposed under section runway lower surfaces such that all sections curl
together in a same first direction of rotation to fold and uncurl in a second
direction of rotation opposite said first direction of rotation to unfold, a
runway undersurface of the a first section at a ramp first end folding into
parallel face-to-face opposition with a runway undersurface of ~~the an~~
adjacent second section forming a pair of sections, said pair of sections
rotating with the top surface of said first section folding into parallel face-
to-face opposition with the bottom surface of ~~the a~~ third section adjacent

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said second section forming a trio of sections, said trio of sections rotating with the upper section of said second section folding into parallel face-to-face opposition with the bottom surface of ~~the a~~ a fourth section adjacent said third section forming a compact quartet of sections, wherein ~~the end members come into abutment with adjacent sections~~ unfolded to less than 180 degrees, the sections collectively forming an approximate arc bowed downward, and wherein the hinge comprises a hinge bar passing through section hinge holes in a hinge plate extending ~~vertically downward under the runway lower surface of a first adjacent section of an adjacent pair inward the first section from a first section end member on a first section first end a first, or lower,~~ the lower section longitudinally between the section end members at an upper end of said lower section inward the first section from a first section end member on a first section first end, and a hinge ear on a ~~second~~ lower end of a ~~second, or upper,~~ the upper section ~~adjacent the first section extending longitudinally downward from the second section under the runway lower surface of the first lower section alongside said hinge plate of the lower section aligning holes in the hinge plate and the hinge ear through which~~ holes the hinge bar passes such

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that when the ~~second~~ upper section folds under the ~~first-lower~~ section it
the upper section is under the lower section inward of the end member at
the ~~first-lower~~ section first-upper end,
the sections further comprising vertical panels on section lateral sides from
which the hinge ears and hinge plates extend, wherein the section panels
of each side slide in scissor-like fashion with respective section panels of
an adjacent section upon ramp folding, mutually aligning the folding
sections,
wherein the hinges are spaced apart from the runway bottom surfaces
~~respective measured distances~~ such that the ramp folds in curling fashion
with sections in stacked nesting with section surfaces into close face-to-
face opposition,
wherein a lower adjacent section and an adjacent upper section of said
plurality of sections each further comprising comprise strengthening ribs
extending longitudinally along the respective runway bottom surfaces
between section end members and terminating in longitudinal abutment
with said end members with the ~~respective a~~ said hinge bars ~~bar~~ passing
through rib holes longitudinally between the section end members on one
at an upper end of said lower section end and with rib hinge ears on
~~another a lower end of said upper section end~~ extending from the ribs

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beyond the ~~section ends~~ end member at said lower end of said upper section to the ~~respective said~~ hinge bar ~~which passes~~ passing through said rib holes in the rib ears in like manner of the section panels in said upper end of said lower section, wherein ribs of adjacent panels fold side by side in scissor-like fashion in aligning the sections during folding, wherein each first section rib comprises first and second parallel spaced apart rib members forming a slot therebetween aligned with a rib of the third section such that upon folding the first and second sections as a pair into nesting configuration with the third section, the ribs of the third section move into said first section slots, therein enabling the first section runway top surface to move into close parallel opposition with the third section lower surface ~~impeded~~ unimpeded by third section ribs, and wherein each second section rib comprises first and second parallel spaced apart rib members forming a slot therebetween aligned with a rib of the fourth section such that upon folding the first, second and third sections as a trio into nesting configuration with the fourth section, the ribs of the fourth section move into said second section slots, therein enabling the second section runway top surface to move into close parallel opposition with the fourth section lower surface ~~impeded~~ unimpeded by fourth section ribs.

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20. (Previously presented) The portable foldable ramp of claim 19 wherein the slots of said first and second sections divide the section runway into an inner surface sandwiched between outer surfaces.
21. (Previously presented) The portable foldable ramp of claim 20 wherein the inner surface is different from the outer surfaces.
22. (New claim). The portable foldable ramp of claim 1 wherein a lower adjacent section and an adjacent upper section of said plurality of sections each further comprise strengthening ribs extending longitudinally along the respective runway bottom surfaces between section end members and terminating in longitudinal abutment with said end members
23. (New claim). The portable foldable ramp of claim 1 wherein a said hinge bar passes through rib holes longitudinally between the section end members at an upper end of said lower section and with rib hinge ears extending downward from the ribs on a lower end of said upper section extending from the ribs beyond the end member at said lower end of said upper section to said hinge bar passing through said rib holes in said upper end of said lower section below the ribs of the lower section.
24. (New claim) The portable foldable ramp of claim 1 further comprising said trio of sections rotating with the upper section of said second section folding into

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parallel face-to-face opposition with the bottom surface of a fourth section adjacent said third section forming a compact quartet of sections.

25. (New claim) A portable foldable ramp comprising
- a plurality of ramp sections disposed longitudinally end to end including a first section and a second section longitudinally adjacent the first section, each section comprising a runway,
- a hinge with a hinge bar connecting the adjacent ramp sections, and
- end members transverse on adjacent ramp section ends each end member with an abutting surface facing outward from its respective section end with its normal longitudinal with the ramp the runway ending at the end members with said abutting surfaces of said end members abutting together longitudinally when the ramp is unfolded, rotating on the hinge into and out of abutment such that load forces are conveyed through abutted sections to ramp ends.

26. (New claim) The portable foldable ramp of claim 25 wherein the runway comprises a plurality of runway segments and wherein at least one of said sections comprises a plurality of adjacent boxes, each box comprising two opposing lateral sides spaced apart by two opposing longitudinal sides, the lateral sides and longitudinal sides connecting to form a continuous box circumference, the end member of said section comprising a box longitudinal

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side and respective runway segments comprising box tops, the hinge bar
passing through aligned holes in adjacent boxes securing the adjacent boxes
together.